Knowledge reports without truth

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1 Introduction

I present novel[1] data from Turkish knowledge reports where the proposition express-
ing the belief content can be false without triggering infelicity. I sketch out three al-
ternative hypotheses to account for the facts. Language internal evidence supports a
non-presuppositional treatment of Turkish 'know,' but I am unable, here, to falsify the
two candidate accounts based on lexical ambiguity or presupposition cancellation.

In (1), *bil-*, an attitude predicate taken to correspond to the English *know* is used,
yet the sentence is felicitous in a context where the proposition expressed by the em-
bedded clause is false, that is, where Bernie did not win. For convenience, I refer to
this use of the predicate as *diye bil-* or as *non-factive know*.

(1)   Context: Trump won the elections, but. . .
        Tunç [Bernie kazan-dı   diye] biliyor.
        Tunç Bernie won-PST.3S C   knows
        Tunç *thinks* (lit. #*knows*) that Bernie won.

Compare (1) to (2). The same attitude predicate is used with a nominalized embedded
clause. The sentence is not felicitous if the proposition expressed by the embedded
clause is false. This is what I refer to as *nominalization bil-* or as *factive know*.

(2)   Context: Trump won the elections, but. . .
        # Tunç [Bernie-nin   kazan-dığ-ı-nı]   biliyor.
          Tunç Bernie-GEN win-NMZ-3S-ACC knows
        # Tunç knows that Bernie won.

In the present discussion, I take the 'justified true belief' definition of knowledge to
be an accurate model of *factive* know. I show that, with non-factive know, although the
belief proposition need not be true, it nevertheless requires justification. This makes
non-factive know different from factive know on the one hand (which require truth),

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[1] Translations of examples by Şener, [2], suggest that at least some linguists are aware of the
facts under analysis: In (i), *bil-* is translated by *think* instead of *know*. Native speakers use
this construction productively.

(i)   Pelin [sen Timbuktu-ya   git-ti-n   diye] bil-iyor-muş.
        Pelin you Timbuktu-DAT go-PST-2S C   know-PRES.EVID
        Pelin *thinks* (lit. *knows*) that you went to Timbuktu.   Adapted from [2], ex. (4)

and from neutral belief reports on the other (which do not require justification). I do not intend to make a strong claim here about the *definition* of knowledge, say, from a philosophical standpoint.

Three equally reasonable hypotheses can be formulated to account for the factivity alternation in (1) and (2). First, the *homophony hypothesis* states that Turkish has two homophonous *bil-* predicates, one lexically factive, and the other not. Second, the *lexical factivity hypothesis* states that *bil-* has a single, factive lexical entry. The account based on it attempts to derive non-factive know reports by presupposition cancellation. Last, the *external factivity hypothesis* states that *bil-* has a single, non-factive lexical entry. The account based on it attempts to generate factivity compositionally. In principle, these hypotheses are distinct from their particular implementations. In discussing them, I will have in mind the presupposition based analysis of factive know as a convergence or a departure point [6].

Non-presuppositional accounts of *know* exist in the literature. For instance, Romoli ([11]) treats *know*'s 'presupposition' as an implicature. His account relies on lexically specified alternatives. Given that in Turkish, the factivity alternation seems to be conditioned by syntax, I believe that lexical hypotheses should be present in mind but kept as a last resort. Another line of research ([1], [8], [10]) argues that attitude predicates do not directly compose with propositional objects at all, hence that they cannot impose conditions (like a truth presupposition) on an embedded proposition.

2 Non-factive know

In this section, I compare the felicity conditions of factive knowledge and non-factive knowledge with *bil-*, 'know,' and neutral belief with *düşün-*, 'think.' The picture that emerges is that an attitude report with factive know is felicitous only if the belief proposition is justified and true. An attitude report with non-factive know requires the belief to be justified, but not that it be true. A neutral belief report requires neither justification nor truth. This is summarized in (3):

(3)

| | | requirement | | |
		belief	*justification*	*truth*
	factive know	yes	yes	yes
att. pred.	*non-factive know*	yes	yes	no
	think	yes	no	no

2.1 The data

In table (6), I report the felicity of the sentences in (4) across four conditions crossing: justification of the belief (J, ¬J) and truth of the belief proposition (T, ¬T). The content of the belief is kept constant: that *Bernie won*. The nature of the attitude varies: A tensed clause clause is embedded under *bil-* in (4a) to give rise to non-factive know,

a nominalization is under *bil-* in (4b) for factive know, and a nominalization[2] under *düşün*, 'think,' in (4c) for neutral belief.

(4)   a.   Tunç [Bernie kazan-dı   diye] biliyor.
           Tunç Bernie win-PST.3S C   knows
           Tunç *thinks* (lit. *knows*) that Bernie won.

      b.   Tunç [Bernie-nin kazan-dığ-ı-nı]   biliyor.
           Tunç Bernie-GEN win-NMZ-3S-ACC knows
           Tunç knows that Bernie won.

      c.   Tunç [Bernie-nin kazandığ-ı-nı]   düşünüyo.
           Tunç Bernie-GEN win-NMZ-3S-ACC thinks
           Tunç thinks that Bernie won.

Suppose the overall context in (5), and the four conditions in (a-d).

(5)   **Overall context for (4)**: Tunç is in solitary confinement when the US presidential election happen. He has no access to the news, and his guards do not communicate with him. He gets out after the elections. Somebody teases him: "So, who won?" Tunç, who is a fervent Bernie supporter, says "Bernie won."
      Conditions:
      a.   Tunç has no information. Trump won.   ¬J, ¬T
      b.   Tunç has no information. Bernie won.   ¬J, T
      c.   Tunç overheard some talk about Bernie's victory during his confinement. This was a prank! Trump won.   J, ¬T
      d.   Tunç overheard some talk about Bernie's victory during his confinement. This was not a prank. Bernie won.   J, T

The first pattern to note in table (6) is that justification[3] licenses the use of *bil-*, 'know,' in general. This is seen in the contrast between the first three rows and the last three rows in the table. 'Think' is felicitous in the absence of justification, regardless of whether the belief proposition is true or false. The second observation is that factive know is not licensed by justification alone, but that it requires truth as well. The final observation is that if factive know is licensed, non-factive know and think sound odd, and not maximally collaborative. I assume that this is a pragmatic effect.

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[2] I fail to detect any meaning difference between sentences where a tensed clause under 'think,' compared to those with a nominalization. Further research is required here.

[3] For the importance of justification in ensuring the felicity of knowledge ascription, see Kratzer's [7] discussion of a Bertrand Russell example. In these examples, the kind of justification that suffices to license both factive and non-factive know is weak and problematic justification cases are not discussed. Further research is required to determine what kind of evidence is 'good enough' to license knowledge ascriptions with *bil-*.

(6)

| | | true? | | |
		no Trump	yes Bernie	att. pred.
justified?	no	# (4a)	# (4a)	non-factive know
		# (4b)	# (4b)	factive know
		✓ (4c)	✓ (4c)	think
	yes	✓ (4a)	(✓) (4a)	non-factive know
		# (4b)	✓ (4b)	factive know
		✓ (4c)	(✓) (4c)	think

2.2 The cross-linguistic perspective

From a cross-linguistic perspective, the predicate *diye bil-* might be related to ones described by Kierstead ([5]), for Tagalog, and Glass ([3]), for Mandarin. Tagalog *akala* and Mandarin *yǐwéi* are belief predicates that seem to express mistaken belief, with a third person attitude holder. Glass reports that, if the attitude holder is also the speaker, the result is a hedgy belief report (rather than a mistaken one, which would presumably be a 'monster'). I leave out the discussion of first person attitude holders here in the interest of space, but Turkish is similar to Mandarin in that non-factive know in the first person signals that: the speaker$_i$ is justified in believing that p but that they$_i$ are open to the possibility that *not p*. Furthermore, data from a native speaker consultant suggests that justification plays a crucial role in licensing *yǐwéi*, which I claim is also the case for *diye bil-*.

The Turkish facts described here are an interesting addition to the Tagalog and Mandarin data, given that although *diye bil-* is sometimes used to express mistaken belief, this is not always the case. Illustrated in (7) is a use of *diye bil-* where the speaker lacks knowledge about p, but asserts that a third person is justified in believing that p. This kind of use is consistent with the 'justified but not necessarily true' description of *diye bil-*, but it shows that Glass's account of *yǐwéi* does not straightforwardly extend to Turkish.

(7) Context: The speaker is asked: "Who won the election?"
Valla ben bilmiyorum ama Tunç Bernie kazandı diye biliyo.
tbh I don't.know but Tunç Bernie won C knows
To be honest, I don't know, but Tunç *thinks* (lit. *knows*) Bernie won.

Consequently, *diye bil-* does not mean *falsely believe* (though this is sometimes an attested inference). Moreover, the alternation in the truth requirement is observed for the attitude predicate otherwise used to express *knowledge*. (Compare Tagalog *akala*, '(falsely) believe' to *alam*, 'know,' and Mandarin *yǐweí* to *zhīdaò*.) Moreover, Finally, the meaning of non-factive know depends on the syntax of the embedded clause, rather than on the choice of a particular lexical item (modulo the possibility of homophony).

3 Three hypotheses to account for the factivity alternation

In this section, I formulate three hypotheses to account for the factivity alternation: *bil-* is factive when it combines with nominalized clauses, but not with tensed clauses. The second and third hypotheses are not grounded on homophony.

3.1 The homophony hypothesis

The homophony hypothesis is that the Turkish lexicon contains two homophonous attitude predicates *bil-*_{FACTIVE} and *bil-*_{NON-FACTIVE}.

The two predicates select for different kinds of propositional objects, respectively a nominalized and a tensed clause, that have in common the feature of forming the content of a justified belief. The predicate *bil-*_{FACTIVE} further imposes the condition that the object denote a true proposition, whereas *bil-*_{NON-FACTIVE} comes with no such condition. The former corresponds to the familiar factive predicate 'know.' The latter is a more unusual predicate, yet one that fits cross-linguistic patterns.

A native speaker consultant of Mandarin (p.c.) reports that *yǐwéi*, like *diye bil-*, requires the reported belief be justified (in addition to expressing that the belief is false, in Mandarin, as described by Glass [3]). The existence of two distinct attitude verbs, one for knowledge (*zhīdaò*) and the other for justified (yet perhaps false) belief, provides support for the homophony hypothesis. Turkish has both 'know' and a predicate like *yǐwéi*, which happen to be pronounced the same.

I do not see an easy way of dismissing this hypothesis on empirical grounds, and this is perhaps a reason to set it aside for now.

3.2 The lexical factivity hypothesis

The second option is to maintain the view that *bil-* is lexically factive in all of its occurrences. Let us refer to this hypothesis as the "lexical factivity hypothesis."

A traditional way of encoding factivity in the attitude predicate's lexical entry is to say that it presupposes the truth of the propositional object it composes with [6]. This view commits us to considering this propositional object as the attitude predicate's complement.[4] The definition of a predicate like *bil-* can be written as in (8):

(8) $\llbracket \text{bil-} \rrbracket^w = \lambda p_{st} . \lambda x_e : p(w)=1 . \forall w' \ w' \in \text{DOX}(x,w) \rightarrow p(w')=1$

This function is defined only if the proposition expressed by *bil-*'s complement is true in the world of evaluation, and returns true only if that proposition is true in all of the attitude holder's belief worlds.

Under this hypothesis, factive knowledge reports do not pose a particular challenge. However, all attitude reports with *bil-* are predicted to be factive, which is contrary to fact. Given that the presupposition component is responsible for factivity here,

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[4] It is an open question for me whether this commitment is required. Turkish internal facts, as well as recent cross-linguistic results, suggest that attitude predicates do not take CPs as complements.

to capture non-factive attitude reports with *bil-*, we must cancel the presupposition compositionally.

At least since Kartunnen [4], the literature acknowledges the existence of 'plugs,' which block presuppositions from projecting. One type of plug is non-factive attitude and speech predicates: If a presupposition trigger is embedded under such a predicate, the presupposition seems to fail to project. A naturally occurring example is provided in (9), where *know p* does not, to be felicitous, require *p* to be true in the world of evaluation of the sentence.

(9)   Sansa thinks she knows that Theon killed her two younger brothers [. . .][5]
        (Theon did not kill Sansa's brothers.)

A way of accounting for the 'plugging' of the presupposition is to assume that the world argument of the proposition in the presupposition component is bound by the universal quantifier introduced by 'think.' Then, it suffices for the proposition expressed by the embedded clause to be true in all of Sansa's think-worlds, which need not include the world in which the entire sentence is evaluated. This would indeed have the effect of committing the matrix subject to the truth of the proposition expressed by 'Theon killed [Sansa]'s brothers,' but not the speaker.

Recall that, in Turkish, clauses embedded under *bil-* that give rise to non-factive attitude reports are introduced by *diye*. Consequently, it would suffice to write in *diye*'s meaning whatever it is in *think*'s meaning that makes it act like a plug,[6].

3.3   The external factivity hypothesis

The third hypothesis, "external factivity," states that *bil-* does not encode factivity in its lexical entry at all. (Keeping to the particular construal of factivity discussed up to now, this can be reformulated as: *bil-* is not a presupposition trigger.)

The first question that this hypothesis raises is what the meaning of *bil-* is. In the data section, we observed that justification sets belief reports apart from knowledge reports. This fact could be written down in the lexicon, informally as in (10):

(10)   S bil- p := S has the justified belief that p
                                    for S, an attitude holder, and p, a proposition

The definition encodes the justification requirement, and remains silent about the truth of *p*. This gives us a way of accounting for the non-factive uses of *bil-*, uses that are distinct from plain belief or thought reports. But, a consequence of the external factivity hypothesis is that we must have a way of generating factivity compositionally. This is a requirement given that *bil-* gives rise to factive readings with nominalized clauses.

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[5] http://pickledwhale.weebly.com/blog/quite-the-little-finger-indeed

[6] A colleague reports that not all languages behave like English in allowing the presupposition of 'know' to be plugged under 'think,' giving Russian as an example. This could be a point of cross-linguistic variation: where English 'know' has a variable in its presupposition, Russian 'know' would have a constant, the actual world.

The question then is what, in the semantics, has the potential to introduce factivity? Drawing on work by Kratzer [8], [9] and others [1], [10], the external factivity hypothesis receives a particular implementation with the assumptions that: attitude predicates do not take clauses directly as their syntactic complement, and that modality is introduced from within the embedded clause, by the complementizer.

4   Concluding remarks

This paper introduces novel data from Turkish attitude reports that suggests that *bil-* is interpreted as factive or not depending on the syntactic type of the propositional object it combines with. Three candidate hypotheses are sketched out, and deciding between them is left for future investigation.

Systems where attitude predicates do not directly take tensed clauses as arguments receive some support from Turkish. Nominalized clauses have an internal clausal structure, but on the outside they are DPs. Attitude predicates, then, interface with DPs. It is not unreasonable to think that the mode of syntactic combination here is complementation. On the other hand, independent evidence suggests that tensed clauses introduced by *diye* are modifiers. It is then tempting to relate the factivity alternation to syntactic and semantic composition.

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